

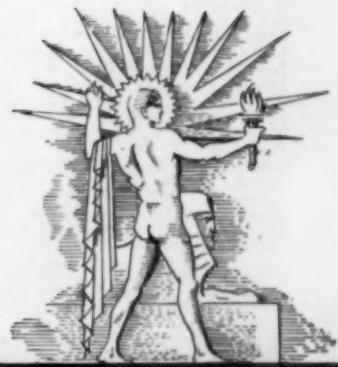
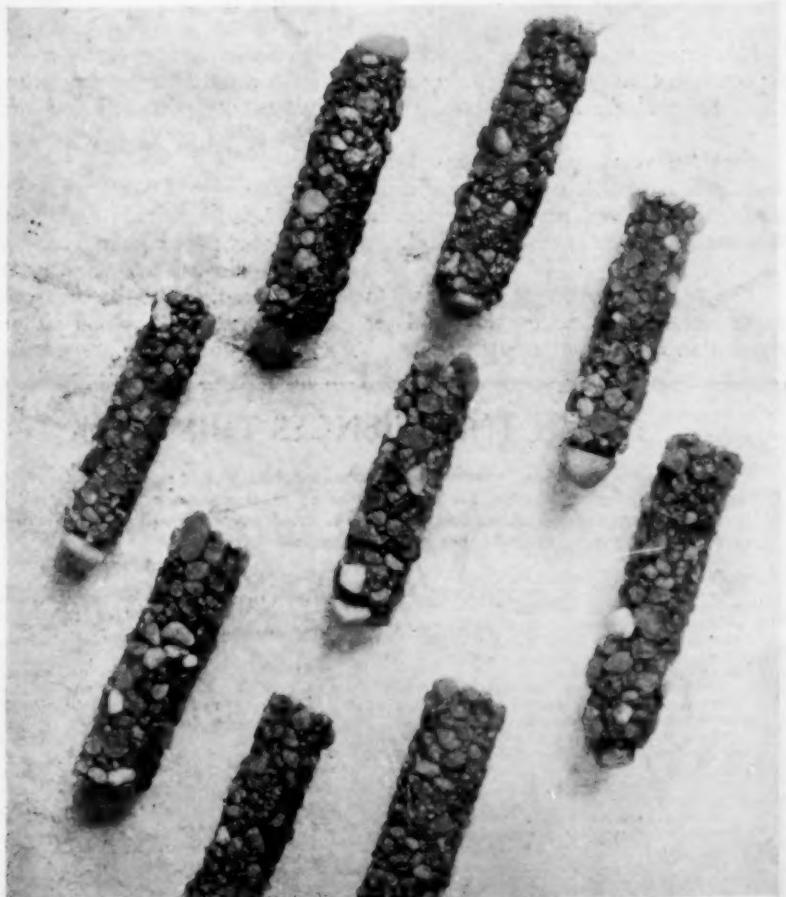
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



SEPTEMBER 3, 1932

Mosaic Jewelry By Insects

See Page 149

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SCIENCE SERVICE PUBLICATION

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No. 595

The Weekly Summary of Current Science



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DO YOU KNOW THAT?

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A tame beaver will respond to its name.

Water of the Pacific Ocean contains less oxygen than water of the Atlantic.

As a South African buffalo grows older its horns become shorter and thicker.

Rural highways in this country increased in mileage 41 per cent. from 1904 to 1929.

Rice was brought to this country by a sea captain, returning from a voyage to Madagascar, in 1694.

Measuring thunderbolts, a scientist reported that an average lightning flash has a force of about 100,000,000 volts.

For four years, Bureau of Standards scientists have been testing different kinds of slate, and great differences in weather resistance have been found.

The ocean contains enough salts to cover the United States with a layer more than a mile and a half deep.

With the exception of the gorilla, all the apes are tree dwellers.

The giant cactus begins to bear fruit when about fifty years old and is not full grown until it reaches the century mark.

A cookbook published by the U. S. Department of Agriculture has been reproduced in the raised Braille type for the blind.

A survey of 1,882 dairy farms in New Hampshire, Connecticut, New Jersey, and Pennsylvania showed that 35 per cent. had milking machines.

In Soviet Russia, where medicine is a state function, the government is spending \$987,000,000 on health work, an increase of 46 per cent. over last year.

For more than 3,000 years Arabs have bred their high-grade Arab steeds without thought for consanguinity, which to some zoologists indicates that the evils of inbreeding lie in transmission of disease and feeble blood rather than in the inbreeding itself.

WITH THE SCIENCES THIS WEEK

Curiosity arousing questions for the teacher and general reader. Book references in italic type are not sources of information of the articles, but are references for further reading. Books cited can be supplied by Librarian, Science Service, at publisher's price, prepaid in U. S.

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What animal did the new-found race in Africa use largely for food? p. 147

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ARCHAEOLOGY

Did cave men believe in magic? p. 154

How have scientists learned from pot blacked spots what ancient people lived on? p. 148

Where is El Castillo? p. 143. *Ancient Cities and Modern Tribes*—Thomas Gann—Scribner's, 1926, \$5.

ASTRONOMY

On what subject will a prominent British astronomer lecture over a radio network in the United States? p. 149. *The Nature of the Physical World*—A. S. Eddington—Macmillan, 1929, \$3.75.

What is the most conspicuous constellation? p. 150

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To accomplish what purpose has a scientist suggested that the size of an individual inheritance be limited by law? p. 144

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Why does the new quarter contain a picture of the large eagle? p. 146

PHYSIOLOGY

Has lactic acid anything to do with the hang-over after an alcoholic debauch? p. 147

PUBLIC HEALTH

What does leprosy mean to most Hawaiian families? p. 153

What new method of travel increases danger of the spread of yellow fever? p. 144. *Riders of the Plagues*—James A. Tobey—Scribner's, 1930, \$3.50.

GENETICS

X-Rays Can Speed Up And Reverse Evolution

First Bombardment of Fruit Flies Changes Unborn Insects While Second Treatment Restores Original Traits

X-RAYS can speed up the processes of evolution, and they can also reverse its direction, undoing changes which they themselves have caused. This was announced at the meeting of the Sixth International Congress of Genetics at Ithaca, N. Y., by Dr. N. W. Timoféeff-Ressovsky.

The discovery of the evolution-reversing power of X-rays was made as the result of researches conducted at the Kaiser-Wilhelm Institute for Brain Research in Berlin. It agrees with similar results obtained by other workers in the same field.

Dr. Timoféeff-Ressovsky worked with fruit flies, classic experimental animals in genetics, using the X-ray technique for producing hereditary changes developed by Prof. H. J. Muller of the University of Texas. Bombardment of their reproductive cells with X-rays caused marked changes in color, shape, size, etc., of eyes, bristles and other body parts in their offspring. Dr. Timoféeff-Ressovsky discovered that a second bombardment inflicted on these same offspring would often reverse the changes, causing the third generation to have a normal appearance again.

From his results he argued that the effects of an X-ray bombardment are not merely destructive of the genes, as has frequently been stated. He pointed out that while the production of an abnormality might look like a destructive effect, the return to normalcy by a second X-ray bombardment makes this conclusion absurd.

Fern Spores X-Rayed

Other strange effects of X-ray bombardment were demonstrated by Dr. Lewis Knudson of Cornell University, with a series of cultures of ferns in their earliest stages of growth. The spores from which they sprouted were treated with X-rays at varying intensities and lengths of exposure. Doses of 2,500 and 5,000 roentgens increased the rate and quantity of growth. But doses from 7,000 to 30,000 roentgens stopped growth altogether. These heavier X-ray

ings, however, did not kill the sporeling ferns, for examination with the microscope has shown that they produced one or two massive cells that continue to live but do not grow, although they have been kept for over six months.

These cells of arrested growth possess chlorophyll, and presumably manufacture carbohydrate foods for themselves. No theory has yet been advanced regarding the mechanism of this growth stoppage caused by X-rays.

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ARCHAEOLOGY

Treasure Unearthed From Maya Pyramid

UNDER the main stairway of the imposing El Castillo, chief of the temple-topped pyramids of the ancient Maya city of Chichen Itza, Mexican archaeologists found a treasure cache hidden centuries ago. A jade necklace with carved pendants, one representing a Maya god and others bearing hieroglyphs, which is pictured here, is one of the most important finds.

A pottery vessel containing small bones, as yet unidentified and perhaps human, was in the cache. Necklaces of

coral, jade and turquoise were mingled with the head of a dried lizard, a magic jade ball used for healing and divining, and other objects.

Lino Bravo, of the Mexico City National Museum, has gone to Yucatan to restore a jade and turquoise plaque seven inches in diameter, which was found in a jar along with 2,000 small turquoises. A jade object with a bit of ancient cloth stuck to it is also being studied. Four flint spearheads, from twelve to sixteen inches long, were also in the cache.

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ELECTRICITY

Low Resistance in Cold Intrigues Engineers

ELECTRICAL ENGINEERS who know the cost of ordinary transmission of electrical current along wires look with longing eyes upon experiments performed within the confines of extremely frigid liquid helium.

At temperatures far below those common here on earth, some 268 degrees Centigrade below the freezing point of water, a current set up by induction in a lead coil will continue to flow for hours with little falling off of intensity.

Members of the Royal Institution in London had this experiment performed for them by Prof. J. C. McLennan, the University of Toronto physicist who has recently retired to England. The phenomenon of superconductivity was discovered over twenty years ago by the Dutch scientist Heike Kamerlingh Onnes and his co-workers, who made Leyden a center of low temperature research. It was a most surprising discov-



FROM ANCIENT TREASURE CACHE

ery, for theory led them to expect that resistance would increase as the cold increased.

To demonstrate this persistence of an electrical current in a metal at a temperature near absolute zero, Colonel the Master of Sempill, a famous British aviator, flew over to Leyden and brought back with him a nest of vacuum bottles, containing at their heart a lead ring with a current flowing within it. The ring was immersed in liquid helium, and the helium flask was kept cold in two bottles of liquid air. The electrical current was still flowing for the edification of the British audience even after the thirteen hours of the international air trip across the North Sea and the auto journey from the airport to London.

The virtual disappearance of electri-

EUGENICS

Larger Families May Again Become Fashionable

LARGE FAMILIES may become fashionable again. A small but distinct tendency in that direction has been discovered among the abler people of the upper social and economic classes, Dr. J. Sanders, of Rotterdam, told the Third International Congress of Eugenics at its meeting in New York. If the war and the post-war period of economic hardships had not had such severe dysgenic effects, the tendency for more offspring among the more gifted would be more widespread, he believes.

Dr. Sanders addressed himself to the problem of taking advantage of this eugenic psychology, so that more as well as better children may be produced by those whose scientific, artistic or organizing abilities give promise of transmission to the next generation. The prime factor, he said, must be public opinion: people must be educated to feel that large families are right and desirable, and especially so among the more talented. This must be done not only by well-directed general propaganda, but must be carried on intensively in the universities, among those preparing for the professions.

In direct economic encouragements, by state grants or remittances of taxes, Dr. Sanders did not express such great confidence, although he believed they might accomplish some good, especially if such aids are directed toward the

cal resistance in gold, silver, tin, mercury and some other metals at extremely low temperatures may raise hopes of practical application, but further research dashes them.

For twenty years metals and their alloys have been tested and superconductivity has not yet been found to occur at a temperature higher than 263 degrees below zero Centigrade. Such temperature is achieved in only a few laboratories. Prof. John F. Allen of the University of Toronto who investigated superconductivity believes:

"It is impossible to say what will happen or be discovered in the future, still it is fairly certain that no direct practical value at least for power transmission will ever come out of the phenomenon of superconductivity."

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special end of securing adequate educations for really gifted children. He made the much more radical suggestion, however, that the size of the individual inheritance of children in small families might be limited by law.

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ZOOLOGY

Two Weeks' Delay Precedes X-Ray Sterility In Mice

X-Rays, long known to cause sterility in male animals if applied in sufficiently heavy doses, yet give mice two weeks of grace before sterility sets in.

This has been determined by experiments performed at the University of Texas, and reported by Dr. George D. Snell before the meeting of the Sixth International Congress of Genetics.

After the mice had been X-rayed, he stated, two weeks elapsed before they became sterile; though litters which they sired during this time were reduced in size. And even after sterility set in, the sperms that were in the tubes leading away from their sex glands were still alive. Living reproductive cells were found still lurking in such mice seven weeks after they had been X-rayed. After that, some months elapsed before the sterile condition passed.

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PUBLIC HEALTH

Yellow Fever Certificates Recommended for Tropics

TRAVELLERS from countries where yellow fever exists, particularly those travelling by air, should have certificates based on blood serum tests showing that they have acquired resistance, or immunity, to the disease, Dr. B. J. Lloyd, assistant to the director of the Pan-American Sanitary Bureau, told the Conference of State and Provincial Health Authorities of North America.

Dr. Lloyd pointed out that yellow fever is still a menace to life and particularly to commerce in the Americas. He quoted a statement of Dr. F. F. Russell of the International Health Division of the Rockefeller Foundation to the effect that, because of the very rapid development of air travel, population centers which once had yellow fever but have now been freed of it are again threatened with reinfection with the disease unless persistent, continued effort is made to keep it within bounds.

Recent discoveries of a method of testing for immunity to yellow fever and of vaccinating against it make possible the certificate-method which Dr. Lloyd suggested. By this means it would be possible to tell definitely whether or not a person desiring to leave a yellow fever community would endanger the country to which he was going. If the test showed that he had immunity to the disease, that would mean either that he had had yellow fever or had been vaccinated against it. In either case, he would not introduce it into a yellow-fever-free country by developing it soon after his arrival.

Dr. Lloyd recommended in addition that aerodromes in infective territory be kept continuously and absolutely free from mosquitoes which carry yellow fever, and that fullest cooperation be maintained between nations, health authorities and transportation companies.

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ENTOMOLOGY

Male Water Bug Has Family Cares Thrust Upon Him

AFATHER, even a proud one, usually feels that he is being a bit put upon if he has to hold the baby. And if it's twins or more, he feels like a martyr indeed. But what would such a rebellious human male think if his wife were to treat him as the water-bug's



FATHER CARRIES BABIES

mate handles her husband? She is bigger and stronger and more masterful than he, and she has a habit of making him "hold the babies" to the extent of several score. And he can't get rid of the unwelcome burden until the eggs hatch.

The photograph is by Cornelia Clarke.
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ENGINEERING

**Engineers Plan Program
Of Movie Standardization**

MOTION pictures are to be standardized, not in drama and plot but in technological equipment and methods used in the industry, if recommendations made to the American Standards Association by the Society of Motion Picture Engineers are carried out.

Picturesque studio terms, such as "blimp," "zoom," "pan," "tilt," "wow," and "flutter" will be given definite meanings. Specifications for film, studio illumination, acoustic treatment, spot lights, cameras, recording equipment, re-recorders, printing equipment, laboratory processes, theater equipment, etc. will be compiled as a guide.

The making of talkies will be aided and made less expensive by such a program of standardization. When the project is approved by the American Standards Association, a committee of technologists representing all branches of the motion picture industry will be organized to work on the standards.

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ECONOMICS

**Energy Survey Being Made
By Jobless Technical Men****Gigantic Study Covering North America For Past Century
Considered Step Toward Depressionless Economic Life**

UNLIKE a business run for profit, there are many different criteria for the success of a civilization. Successful living certainly can not be measured alone in dollars, shillings, francs, yen or talents of silver. Money is a commodity like wheat or iron.

At Columbia University there is in progress an "energy survey" of the North American continent which will be an important addition to the factual knowledge of the world in which Americans live. Three thousand charts are being constructed to trace the total energy required, the men employed, the man-hours worked, and the quantity of commodity produced year by year for the century ending 1930. Three thousand industrial and agricultural products are being surveyed. It is a gigantic task being pushed to completion with the aid of technically trained men which the economic disorder of our civilization has temporarily thrown out of regular jobs.

This will be a valuable supplement to weighted price indices and other financial figures that already exist. Such studies as these are steps toward a planned economic life of the nation in which a depression would be as inexcusable as the failure of a housewife to order the food for dinner. Planning on a national scale is manifestly a most complex problem impossible of solution unless full and current data are at hand.

To Predict Human Needs

Science will play its part in future planning by furnishing methods for predicting human needs, as well as better and easier methods of fulfilling them. Some of the hardships of today are due to the inability of relationships among human beings and machines to keep up with the fertility of applied science.

Nowhere is a complete balance sheet of civilization needed more than in the difficult and basic adjustments of our economic structure in progress today. Attempts to treat the ills of depression without a complete picture of just what

is happening are as foolhardy as surgical operations performed in the dark.

The demand should be for more information and analysis before economic prescriptions are written. Then there will be less danger of killing the patient which is our body politic.

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GENETICS

**Twins Reared Apart Develop
Mental Differences**

IDENTICAL twins separated in infancy and reared apart, as in Shakespeare's "Comedy of Errors," develop differences in mental traits that can be measured by appropriate tests. The summarized records of fifty pairs of such twins were presented before the Sixth International Congress of Genetics by Prof. H. H. Newman of the University of Chicago.

Prof. Newman subjected the fifty separated pairs to the Stanford-Binet intelligence test and the Stanford achievement test, and compared the records thus obtained with similar records from fifty pairs of identical twins who had been reared together, and also from fifty pairs of non-identical twins.

Prof. Newman concluded:

"Fraternal twins, which have half their heredity in common, differ twice as much as do identical twins, with all their heredity in common, when both are reared in the same environments. Identical twins reared in different environments differ twice as much as identical twins in like environments. Thus a 50 per cent. difference in heredity seems to have the same influence in producing differences as do the entire differences of environment in the cases studied. Hence, we may conclude that hereditary differences are about twice as responsible for the differences found as are environmental differences. This does not mean that heredity is twice as important as environment as a factor in development."

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GENETICS

Radish-Cabbage Hybrid Illustrates the "Impossible"

SOMETHING declared impossible by many non-scientific opponents of evolution was exhibited at the Sixth International Congress of Genetics in Ithaca. Fertile crosses between distinct species, and even between separate genera, are growing in a special garden which has been laid out on the grounds of Cornell University.

For some reason, the alleged infertility of crosses or hybrids has long been a prime talking point among anti-evolutionists, though such crosses have long been known to be fertile in some instances.

The most outstanding example on display is a hybrid between radish and cabbage, made by a young Russian scientist, Dr. G. D. Karpechenko of the Leningrad Botanical Institute. Radish and cabbage, though botanically related, are separate genera, and are as far apart for plants as domestic cattle and American buffalo or bison are for animals. The cross was successfully made, and the big lusty plants, looking like giant radish leaves on a cabbage stalk, that are now growing in the garden at Cornell University represent the fifth generation. The cross therefore is certainly not sterile.

Another successful cross made by Dr.



The Science Service radio address next week will be on the subject,

HARDENING OF THE ARTERIES

by

Dr. Herbert Fox

Director of the Pepper Laboratory of Clinical Medicine at the University of Pennsylvania

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Karpechenko is between cabbage and Abyssinian mustard. These plants are somewhat more closely related than radish and cabbage, being separate species within the same genus. Still another thriving inter-specific cross growing in the garden is one between cauliflower and broccoli. This hybrid was originated by Dr. C. H. Pearson, of the California Agricultural Experiment Station, Davis, Calif.

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MEDICINE

Invisible Germs Should Not Stop Disease Fight

JUST because the viruses which cause such diseases as infantile paralysis and the common cold cannot be seen or cannot be grown on lifeless media does not mean that the diseases themselves cannot be controlled, Dr. T. M. Rivers of the Rockefeller Institute for Medical Research told members of the American Society for Clinical Investigation, in an address published in a current issue of *Science*.

The success of Jenner's vaccination against smallpox was firmly established before it was known that bacteria or "germs" cause disease, Dr. Rivers pointed out.

"In order to know an infectious agent it is not essential to see it or to grow it on laboratory media any more than it is imperative to see electricity in order to recognize it and to control it for our daily needs," he said.

While it would be of great importance to the naturalist to know the exact nature of these viruses, Dr. Rivers does not see that it would lead to immediate and great advances in the handling of the virus diseases.

"There are successful methods of vaccination against many virus infections, notably smallpox, yellow fever, rabies, fowl-pox, canine distemper and cattle plague," Dr. Rivers stated.

"I have little patience with those who state that just as soon as the viruses are cultivated on lifeless media it will be possible to make vaccines to prevent and sera to cure the diseases caused by them.

"Numerous diseases spread by means of water, milk, food, filth and insect vectors have been controlled not by preventive vaccines and curative sera, but largely through the improvement of sanitary conditions.

"Many viruses obtain entrance into their hosts by way of the upper respiratory tract," he continued, referring to colds, influenza and the like. "Our inability to control diseases arising in this manner is not due to the fact that we have not used some special kind of media for the cultivation of the viruses, but because it is essential that we breathe, and as yet no one has suggested a practical method of obtaining uninfected air for human beings living among their fellows."

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NUMISMATICS-ORNITHOLOGY

New Washington Quarter Has Wrong Species of Eagle

THE BALD or white-headed eagle, chosen by the founders of the Republic as the national emblem, has been cheated out of a place on the Washington memorial twenty-five cent piece just issued. The bird that roosts on the lictor's fasces on the reverse of the new coin has feathered "trousers" coming clear down to his feet, which marks him as a golden eagle. The golden eagle is native to the Old World as well as to America, and is displayed by the coats-of-arms of several European nations.

The bald eagle, a strictly American bird, has the "trousers" only in his juvenile stage; when mature he is bare-shanked.

The bald eagle is correctly shown on all save one of the other United States coin where an eagle appears at all. The other exception is the half-dollar that came into use just before the World War, on which a "trousered" golden eagle is shown. On all the older coins, the bird is unmistakably a bald eagle.

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ANTHROPOLOGY

New Race of Fossil Men Found in North Africa

Studies Just Completed on Bones From Algiers Indicate Existence of Race Unlike Known Types of Early Man

FOSSILIZED human skeletal remains discovered in the cave of Afalou bou Rhummel, in the commune of Oued Marsa, Algeria, are said by MM. Marcellin Boule and Henri Vallois, the well-known French anthropologists, to represent an early race of man belonging to an entirely new type.

The deposits in the cave were excavated by M. Arambourg, with the financial assistance of the Institut de Paléontologie Humaine, in 1928-9 and were submitted to MM. Boule and Vallois for examination in the laboratories of the Institut and for report.

From the geological, paleontological and archaeological evidence it is concluded by MM. Boule and Vallois that the deposits are of ice or pleistocene age and the culture associated with the human remains belongs to the Capsian stage. The Capsian stone age culture (so-called from the stone-age site at Gafsa, Tunis) is regarded by archaeologists as closely related to the Aurignacian culture of the European upper palaeolithic age, and indeed, some would hold that it is an earlier form of the Aurignacian culture before the latter reached Europe.

The skeletal remains of about 50 individuals were brought to light in the course of the excavations. From these, up to the present, the complete skeletons of nine individuals have been reconstructed.

According to the description of the Afalou type of man given by MM. Boule and Vallois the general aspect of most of the skulls is brutal. The eyebrow ridges unite in a well-developed prominence at the glabella over the root of the nose. This must have given Afalou man a forbidding appearance. The skulls are long-headed or medium in about equal numbers. A short proportion are broad-headed. In many cases there is a chignon-like projection at the back of the skull. The limb bones were very stout and the muscular attachments strongly marked, indicating big muscles and great strength. In stature Afalou man was below the average height.

The upper front teeth had been knocked out early in life, presumably in connection with some puberty ceremonial. In this custom Afalou man resembles Asselar man, another new type of early man from the French Sahara recently described by MM. Boule and Vallois; and the same custom was followed by the Natufians, the late palaeolithic or mesolithic people whose remains were discovered by Miss Garrod in Palestine.

The Afalou race is entirely new and resembles no other known type of early man. It is not like Neanderthal man, nor the Cro-Magnon race of the Upper Palaeolithic in Europe. Nor does it resemble the new Asselar man. It has no resemblance to the Mediterranean race or the Negroes of modern times. It does, however agree with a type which had been discovered previously in Tunisia and Algeria, but for which the evidence of dating was insufficient. The deposits in which it was found are regarded by some as being as late as the neolithic. Some of these skulls were discovered in the kitchen-middens of the cave of Mechta el-Arbi, near Constantine, in Algeria, a cave in which the inhabitants lived largely on snails. It is proposed to call the new type the Mechta race, from the site on which it was first discovered.

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PHYSIOLOGY

Science Explains Hang-Over After Alcoholic Debauch

AN EXPLANATION for the well-recognized "hang-over" following alcoholic debauches is found in a study just completed by Drs. Harold Himwich, E. F. Gildea, and L. H. Nahum at the physiological laboratories of the Yale Medical School and in the Institute of Human Relations.

Dr. Himwich, who has previously determined that the ingestion of large doses of alcohol leads to radical changes in glucose and lactic acid content, the carbon dioxide capacity, and the acidity

of the blood, noted that some of the dogs used in his experiments had unusually high values for lactic acid of the blood long after the last trace of alcohol had disappeared from the blood and after the other abnormalities had been corrected. So he called in some of his associates and turned to human subjects. They have studied carefully nine individuals who were recovering from more or less prolonged alcoholic debauches. And each of them had an increased concentration of lactic acid in the blood.

There also seemed to be some correlation in these human subjects between the recovery of the individual and the disappearance of this accumulation of lactic acid in his blood. At least, in one case, even four days after recovery from alcoholic coma, the lactic acid content of the blood was still high and the patient was still showing some signs of delirium tremens. Two other patients who recovered from acute alcoholism within twenty-four hours had normal lactic acid values within that time.

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CHEMISTRY-AGRICULTURE

New Chemical Used To Fight Fungous Diseases

THE FARMER and lumberman have a new ally in their battle against fungous diseases in a new disinfectant, ethylmercury chloride, the successful use of which has been reported by W. H. Tisdale of E. I. du Pont de Nemours and Company.

This organic mercurial was found to be much more poisonous to fungi and bacteria than is bichloride of mercury, which has been commonly used in agriculture. Yet it is much less likely to injure plants and is not corrosive to metal parts of tools and machinery. Properly diluted and handled with the caution necessary in using any poisonous disinfectant, it is not harmful to animals.

Powders containing 1 to 2 per cent. of the compound can be dusted on the seed of wheat, sorgum, oats and barley in a rotary dusting machine at the rate of 2 or 3 ounces per bushel, effectively controlling various types of smuts.

The new disinfectant, although not yet entirely beyond the developmental stages, is reported as already proving its usefulness also as a soil disinfectant, plant spray, and preparation for the dipping of pine and sap gum boards to prevent the fungous stains commonly called "blue stain," or "sap stain."

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EVOLUTION

Man's Grooming Activities Linked with Apes' Habits

WHEN you feel an overpowering impulse to pick a loose thread off someone else's coat, even if he is a total stranger to you, you needn't be ashamed of it, unconventional though the action may be. For you are only acknowledging your ancestors.

Grooming, the activity we see in the monkey cage when its inhabitants go carefully over each others' fur, picking out thorns or parasites, smoothing down hair, and in general making neighbors pretty, is a basic action pattern in all the primates from the lower monkey-like mammals up to man himself. So declared Prof. Robert M. Yerkes of Yale University, speaking before the Sixth International Congress of Genetics in Ithaca.

Prof. Yerkes' investigations have convinced him that the grooming habit is inborn and hereditary, rather than something which one monkey (or man) learns from another. He cited the case of a young chimpanzee kept isolated from all its kind from infancy onward, which nevertheless developed the grooming tendency, in support of his belief.

In man, the grooming tendency has the most complex expressions. "The activities of barber, hair dresser, nurse, physician, surgeon, find their recognizable counterparts or fundaments in the grooming behavior of the chimpanzee," said Prof. Yerkes.

Science News Letter, September 3, 1932

BIOPHYSICS

Harmful Ultraviolet Rays Do Not Penetrate Seed

ULTRAHIGH rays of shorter wavelength, usually regarded as harmful to living things, cannot penetrate the outer coats of seeds. But those of longer wavelength, which have a stimulating effect, pass through.

This has been determined in preliminary experiments by Drs. Charles A. Shull and Harvey B. Lemon in the plant physiology laboratory of the University of Chicago. They made use of seed coats from corn, peach kernels and cocklebur seeds, stretching them out in front of the slit of spectrograph and focussing ultraviolet rays, filtered to known wavelengths, upon them. The fractions of the radiation that passed

through were recorded on photographic plates. The results apparently indicate that seed coats protect their living contents against harmful ultraviolet radiations but let in those having stimulating effects.

Dr. Shull calls attention to the tendency of some experimenters to use unfiltered ultraviolet, regardless of the fact that they are thereby mixing long and short wavelengths, which have opposite effects and therefore tend to cancel each other out, or if one or the other predominates, its effect is diminished by the extent to which its opposite is present. He suggests the desirability, in all biological experiments, of controlling wavelengths by means of filters, and also of knowing the penetrating power of the radiations used.

Science News Letter, September 3, 1932

ARCHAEOLOGY

Spots on Pottery Show What Earliest Crops Were

BLACK SPOTS of carbonized material, scraped off two broken pieces of Stone Age pottery, have shown that the grain raised by the first farmers in Germany was emmer, a species of wheat whose native land is in western Asia.

The discovery was made by Prof. Johannes Grüss of the University of Berlin, well known for his microscopic researches into remains of food and drink in funeral feast vessels found in Egyptian tombs. In the present instance he had something even older, for the pottery fragments were prehistoric, belonging to the very earliest part of the New Stone Age, only a little while after man had learned to make pots at all.

Prof. Grüss carefully scraped a black powder off the unpromising black spots on the potsherds, treated it with chemicals and examined it with his microscope. Cell walls unmistakably identifiable as the remains of emmer showed up in its field.

With the grain fragments Prof. Grüss also found carbonized wood cells, which he identified as spruce. He deduced that the pot from which the fragments had come had sat in some Neolithic hut fire and had boiled over, the mush or broth of ground-up emmer it contained running down its sides to blacken in the fire. He was able to produce approximate duplicates of emmer cell skeletons by grinding up wheat, making a paste, and heating the latter on a glass slide over a laboratory burner.

Science News Letter, September 3, 1932

IN SCIENCE

ENTOMOLOGY

Even Tiny Insects Afflicted With Tumors

TUMORS are an affliction that visit small as well as great. Even tiny insects may have them.

At the meeting in Ithaca of the Sixth International Congress of Genetics, Prof. Mary B. Stark, of the New York Homeopathic Medical College and Flower Hospital, told of her studies on two types of tumors that appear in *Drosophila*, gnat-size insect famous for its use in many genetic experiments, though more familiar to most of us as a buzzard around fruit stands.

One of the tumor types, Prof. Stark said, is invariably fatal. It attacks the grub or larval stage of the insect, and brings about death before it can become an adult. It attacks only males.

The other type of tumor appears in both males and females, and is quite "benign," never causing death. The insects do not even appear to be seriously inconvenienced.

Science News Letter, September 3, 1932

GENETICS

Chickens Bred To Resist Typhoid

A STRAIN of chickens with a high degree of resistance to fowl typhoid, a bacterial disease highly fatal to most flocks when it gets loose among them, has been developed at the Iowa Agricultural Experiment Station, Dr. W. V. Lambert of Ames told the Sixth International Congress of Genetics at Ithaca.

The new resistant fowls were obtained by a drastic method. Chicks were deliberately given the disease, and the stocks that it failed to kill were used for breeding. After five generations of such crucial selection, a breed has been obtained of which less than 10 per cent die of fowl typhoid, while a comparison group of non-resistant chicks dies off to the extent of 85 per cent. It is hoped by further selection to bring the resistance to a still higher level.

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EN FIELDS

ASTRONOMY

British Astronomer to Talk Over American Radio Chain

SIR ARTHUR S. EDDINGTON, the well-known physicist and astronomer of Cambridge University, England, will deliver three addresses in the United States during September over nationwide radio networks.

His subject for the three is "Our Changing Universe" and it is expected that during the first, from 8 to 8:30 p.m. E.S.T., Thursday, September 8, he will discuss results of observations of the eclipse. The other two are scheduled for September 15 and 22 at the same hour. Stations of the National Broadcasting Company will be used.

While in this country Sir Arthur will observe the eclipse and attend the meeting of the International Astronomical Union in Boston.

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GENETICS

Pituitary Gland Secretion Causes Milk Production

MILK was produced in the mammary glands of experimental animals—even including males—when a newly isolated extract of the anterior lobe of the pituitary gland, considered to contain a new hormone which has been named "prolactin," was injected into their bodies. The experiments leading to this result, which is expected to have much clinical importance, were performed at Cold Spring Harbor, N.Y., by Dr. Oscar Riddle, Dr. Robert W. Bates and Simon W. Dykehorn of the department of genetics of the Carnegie Institution of Washington. The same hormone also causes the production of pigeons' "crop milk," with which they nourish their young.

The anterior part of the pituitary gland, a small body nestling on the under side of the brain, has already been shown to produce two important hormones or internal secretions. One of these is important in governing the body's growth rate, while the other stimulates the activity of the sex glands. The importance of the pituitary gland

in the production of milk was already known, but it had been assumed that one of the two hormones already discovered was responsible for this, and only the finding of the new third hormone has changed this belief.

Female guinea pigs and rabbits injected with prolactin began the production of milk immediately. The secretion of milk in the mammary glands of male guinea pigs was made possible only after the animals received a preliminary injection of another hormone derived from the sex-glands of female animals.

These new results were greatly facilitated by the earlier studies of Dr. Riddle and Miss Pela Fay Braucher who found, a year ago, that the crop-gland of pigeons forms and functions under the influence of some substance produced in the anterior pituitary gland.

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ZOOLOGY

Water Animals Can Absorb Food Through Their Skin

ANIMALS living in the water can absorb dissolved and suspended food materials through their skins, gills and other surfaces in contact with the water. So concludes Dr. E. Harold Hinman of Tulane Medical School, in a study presented through the *Quarterly Review of Biology*.

The question of water animal's ability to get nourishment in this way has been hotly debated by biologists ever since early experiments by a German physiologist named Pütter indicated that they could. The first re-testings of Pütter's theory failed to confirm him; but during recent time animals ranging from mosquito larvae to frogs have been given a chance to "soak in a living through their skins," and in many cases they have been able to do it.

Dr. Hinman's experiments have been conducted mainly on mosquito larvae reared in water that had been put through a filter so fine that it strained out even the bacteria. The infant insects therefore had no solid food whatever, and had to subsist entirely on what supplies they found dissolved or suspended in the water. In common with several other researchers who used more or less similar methods, he found that they could do so. Dr. Hinman is of the opinion that mosquito larvae so fed get their nourishment by absorption through their intestinal wall rather than through the skin.

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GENETICS

Fatherless Grasshoppers Produced in Laboratory

"THE BROOD of folly without father bred"—classic line of scorn addressed by John Milton to "vain, deluding joys," might now be equally well used against the grasshopper, Aesop's type and symbol of frivolity. For at the University of Iowa two zoologists, Eleanor H. Slifer and Dr. Robert L. King, have demonstrated that grasshopper eggs laid by unmated females can and often do hatch into insects that live and grow to full size. Such fatherless grasshoppers develop, somewhat more slowly than do normally sired insects, and they are always females.

Miss Slifer and Dr. King reported on the newly observed phenomenon at the meeting of the Sixth International Congress of Genetics at Ithaca.

Parthenogenesis, or production of young by unmated females, is very common among the lower groups of animals, including some species of insects. Aphids or "plant lice" produce generation after generation of females every year with never a male among them until fall comes. If a bee colony loses its queen, eggs laid by unmated queens or even by the usually "spinster" workers will hatch and develop; but all the bees thus produced are useless males, or drones.

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ENTOMOLOGY

Insect Larvae Make Mosaic Jewelry

See Front Cover

MANUFACTURERS of modern jewelry might well turn to the larvae of the caddis fly for effective models for small containers—tiny perfume bottles, say, or lipstick cases. These water-dwelling "worms" build mosaic coverings for the little cylindrical houses they spin for themselves, taking bits of sand and gravel from the streambed, and stopping the posterior ends with larger pebbles. These mosaic cases serve at once as camouflage and armor.

Artists of another group—designers of print goods—might also learn from the caddis fly larvae, as Cornelia Clarke has shown in arranging the group of nine shown on the cover of this issue of the SCIENCE NEWS LETTER.

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ASTRONOMY

September Evening Skies

By JAMES STOKLEY

MOST CONSPICUOUS of the stellar decorations of the September evening skies is the "Northern Cross," also known as Cygnus, the swan, which shines high overhead. Brightest star in the group is Deneb, which the astronomers call alpha Cygni, at the head of the cross. Deneb is close to the zenith. Running from it to the southwest is a row of stars which outlines the upright piece of the cross and terminates in the star called Albireo, or beta Cygni.

The use of the Greek letters, "alpha" and "beta," is in accord with the astronomical practice universally adopted since its introduction in a famous set of star maps published in 1603, Johann Bayer's "Uranometria." "Cygni" is the genitive case of the Latin name "Cygnus," which means "swan," and is used with the Greek letters in order of brightness. Thus "alpha Cygni" indicates to those familiar with this system that it is the brightest star in the constellation, while beta Cygni is the second brightest.

There are a few exceptions to this rule. In the case of Ursa Major, the great bear, which now appears low in the northwest, alpha and beta are the two pointers, and then the other Greek letters follow the stars of the great dipper. This is done because the dipper is such a well-known figure.

Deneb and Albireo, then, are the brightest stars in Cygnus, and when the group is considered as a bird, rather than the northern cross, they mark respectively its tail and its head. The lower part of the upright piece of the cross is the swan's long neck, outstretched as he flies to the southwest. Two fainter stars on opposite sides of the long row represent both the cross piece or the bird's wings.

South of Cygnus is another bird—an eagle. Aquila is marked by the brilliant star Altair. Directly west of Deneb and forming with Altair a large isosceles triangle, is Vega in the constellation of Lyra, the lyre. Vega is the fourth brightest star in the heavens, and of the stars seen in the winter from the latitude of most of the United States, it is only exceeded in brightness by Sirius.

Another characteristic star figure now visible is the "Great Square of Pegasus." High in the east just below Cygnus is

Pegasus, the flying horse. Three stars in Pegasus, with one in the neighboring constellation of Andromeda, form the square, which can easily be identified. As it appears these September evenings with the square standing on one corner, the star in Andromeda, called Alpheratz, is to the left. Andromeda represents the famous chained lady of mythology.

Next to Andromeda to the left is Perseus, and next to him low in the northeast is the constellation Auriga, just coming into view, with the brilliant Capella to mark it. Later in the night at this season, and in the early evening a few months hence, Auriga will be a prominent group in the northern sky.

Fomalhaut Diminishing

Another first magnitude star is seen low in the south. This is Fomalhaut in Piscis Austrinus, the southern fish, but unlike Auriga, this group will not become much more conspicuous than it is now—at least not for a far longer time. Piscis Austrinus is a constellation of the southern skies, that can best be seen from countries to the south of the United States.

However, once in a period of nearly 26,000 years, the entire heavens make a turn around a point in the northern constellation of Draco, the dragon. This is called the precessional cycle. One of its effects is successively to bring different stars to the north pole, so that our present pole star, Polaris, in Ursa Minor, the little bear, has not always occupied that post, nor will it continue to do so. Another effect of the precessional cycle is to raise stars that now

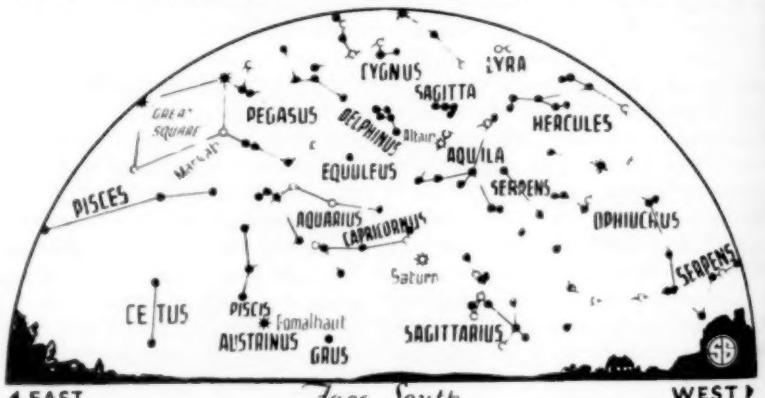
never appear in our skies, high into view. Thus in about ten thousand years the famous southern cross will be seen from the present position of Washington, while Piscis Austrinus and other groups that now only appear briefly at certain times of year low in the south will be as conspicuous as Cygnus or Pegasus.

Another bright star of the September evening sky is seen to the west in the constellation of Bootes. This star is Arcturus, which has been conspicuous during the summer months but is now about to disappear from evening view until next year.

In the southern sky a little to the west of the south point can be seen another brilliant object, which is not a star at all but the planet Saturn. This most extraordinary member of the sun's family of planets is now in the constellation of Sagittarius, the Archer. Of all the planets that can be seen with the unaided eye Saturn is the most distant and was thought to represent the limit of the solar system until 1781 when the English astronomer, Sir William Herschel, discovered Uranus. After that came discoveries of Neptune in 1846 and of Pluto in 1930 to push back still farther the boundaries of the system. And even now, in the opinion of many astronomers, the limit has not been reached. Few students of the stars would be surprised if tomorrow it were announced that photographs made at some great observatory had revealed the presence of a planet beyond Pluto, or even of another beyond that.

The earth is about 92,900,000 miles

* * * • SYMBOLS FOR STARS IN ORDER OF BRILLIANCE



RINGED PLANET, SATURN, SHINES IN THE SOUTH



THE SWAN, CYGNUS, FLIES OVERHEAD

from the sun and Saturn revolves around it at an average distance of 885,900,000 miles. However, its orbit is not truly round but rather eccentric and its distance from the sun varies by about 100,000,000 miles. When closest to the earth it is only 745,000,000 miles from us but it can recede to a distance of more than a billion miles.

Saturn is far larger than the earth, having a diameter of 71,500 miles, a little more than nine times that of our own planet. But the remarkable thing about Saturn is revealed by a small telescope. This is its system of rings which surround the planet.

Three Rings

There are really three of them. The outer one is 171,000 miles in diameter and about 10,000 miles wide. Then comes a gap about 8,000 miles wide known as "Cassini's division" after the famous French astronomer who discovered it in 1675. Next is the ring B, about 16,000 miles wide, and much brighter than the other two. After that comes a narrow gap, probably not more than a thousand miles wide, and finally the inner ring, which is very faint and difficult to observe, except with a large telescope. This is sometimes called the "crepe ring" and is about 11,500 miles wide. This makes the entire system about 41,500 miles in width and leaves a space of some 7,000 miles between them and the surface of the planet. In other words, their size is such that four balls each the size of the earth might be rolled around on the rings, one each on the outer and inner rings, and two, side by side on the second one.

However, this is an experiment that could not be made, even if it were possible to get the earth-size marbles. The rings are not the solid flat structures they appear when viewed in the tele-

scope. Instead, they are swarms of tiny moons, so small and close together that even the most powerful optical aid fails to reveal the individual particles. And in addition, Saturn has nine other moons, of a more conventional size, so that this planet is entitled to rate as one of the most remarkable of celestial bodies.

Returning to the stars, let us give our attention again to Cygnus. With a pair of binoculars or even an opera glass the region of Cygnus is most interesting, for it is right in the heart of the Milky Way and swarms of stars, though occasional dark gaps can be seen. One of these, sometimes called the "coal sack," is just to the south of Deneb in the right triangle formed by the upper part of the cross and the arm to the southeast. At one time this and other similar objects were thought to be actual holes in the sky, regions devoid of stars. But now it is believed that they are clouds of dark matter, cosmic dust, obscuring the stars beyond.

With a more powerful aid to the vision such as a small telescope the star Albireo is most interesting. It is one of the large class of double stars, pairs of suns which revolve around each other. Its chief feature, aside from its brilliance, is that the two bodies which constitute it are not of the same color, but one is yellow and the other blue, so that it is one of the most beautiful telescopic objects in the sky. At this time of the year it is being shown in the many observatories that are regularly open to the public.

The moon during September is at first quarter on the seventh, full on the fourteenth, at last quarter on the twenty-second and new on the thirtieth. On the fourteenth when it is full it will pass partly into the shadow of the earth, and there will be an eclipse of the

moon. Unfortunately, it will not be visible from the United States because it will be at its height at 4:05 p. m., eastern standard time, and will be completely over by sunset here when the moon rises. It will be seen, however, from most of Europe and Africa and the Atlantic Ocean, while the end will be seen from Newfoundland and the easternmost part of South America.

Early in the morning of September 23, at 1:16 a. m., eastern standard time, an interesting event happens when the sun passes into the zodiacal sign of Libra. This point is called the autumnal equinox and is taken as the beginning of autumn. At this time of year, the sun rises directly east, and sets directly west, so that it is above the horizon just as long as it is below, and the days and nights are of equal length. After this the sun continues its southward motion through the sky, and the days will continue to get shorter and the nights longer until December.

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ANTHROPOLOGY

Indian Drum Religion is Thriving American Cult

A RELIGION which centers about a drum is the curious cult adopted by Menominee Indians of Wisconsin. Songs which are an important part of this modern Indian religion have just been recorded for scientists by Miss Frances Densmore, collaborator of the Smithsonian Institution.

Reporting the results of her investigation among these Indians, Miss Densmore says that the drum religion combines old Indian thought with some features of Christianity. Rites of the cult require use of a sacred drum which "has a heart inside it." The heart is the tongue of a pony bell which rings as the instrument is beaten. At a certain point in the ceremony the drum is struck, and the answer of the bell inside is said to mean that the drum has heard what is said and will answer the petition.

Among the teachings of the cult, as described by one leader in the drum religion, are: "If any one tries to quarrel with you, walk away. If any one is talking bad about any one, walk away. If a bad scheme is afloat, walk away. The drum religion is strictly against moonshine, and teaches that men must not steal."

An important feature of the ceremonies, Miss Densmore found, is the practice of contributing money to the

drum. This money is an insurance fund. Any member of the drum lodge who is sick or in need can draw upon the fund with the consent of the others.

Some of the Indians say that the drum religion was started by an inspired prophetess of the Sioux tribe, about fifty years ago. This prophetess told her people to put away their small drums they used, and to stop their war dances and pipe dances, and to dance only the new dance which the spirits had taught her. She taught the people how to make a big drum, big enough to keep away the bad spirit.

Miss Densmore made scientific records of the songs used in the drum ceremonies, and also songs of the medicine lodge, the rival of the drum religion among the Menominee.

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ORNITHOLOGY

Florida Noddy Terns Change Nesting Habits

"TOUCHING WOOD," a potent magic ritual in children's games, seems to be a necessity in the family of the noddy tern of Florida. At least, this would seem to be indicated by observations made recently on Bird Key, celebrated Florida rookery, by Dr. Paul Bartsch of the Smithsonian Institution.

The noddy tern colony on this island had long nested in the branches of the bay-cedar trees, building loose, rather crude nests of sticks, sometimes lined with shells and coral. During the past few years, however, practically the whole tree and bush vegetation of the island has been swept away by hurricanes, and the birds were confronted with the choice between migrating to a new nesting ground where trees still grew, or remaining where they were and adapting their habits to nesting on the ground.

They elected the latter course. But the old instinct for a wooden nest has stuck with them, and Dr. Bartsch reports that they still gather sticks and assemble them into the semblance of nests on the ground. Sometimes they lay their eggs on pieces of bare board. Anything seems to be satisfactory, so long as it is wood.

The noddies are stout defenders of their homes, Dr. Bartsch states, attacking all comers who approach their nests, regardless of size or formidability.

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Ten miles up, air is cooler over the equator than over temperate zones.

MEDICINE

Whooping Cough Relieved By Inhaling Carbon Dioxide

INHALING carbon dioxide, diluted in air or oxygen, has been helpful in relieving the paroxysmal or whooping stage of whooping cough, Prof. Yandell Henderson of Yale University has just reported to the American Medical Association.

The treatment was successfully given to ten children, ranging between nine months and seven years of age. In all of them after three or four days of inhalation the paroxysms were considerably lessened in severity and frequency and by the eighth day the coughing became so infrequent that the treatments could be stopped.

A mixture containing between six and seven per cent. of carbon dioxide in air or a mixture of seven per cent. carbon dioxide and 93 per cent. oxygen was used. The mixture was inhaled through a mask attached to a standard anesthesia machine. A small tent having a capacity of about one cubic foot was used for some children who did not like the mask. The tent apparatus was left in the home and used by the nurse or mother.

FORESTRY

Better Trees Being Bred For Future Forest Crops

PINES and walnut trees are being bred like corn or wheat, to be the crops on forest land in the coming days when forests will have to be raised as grain is raised now. Progress in this work was described by Lloyd Austin, director of the Institute of Forest Genetics at Placerville, Calif., speaking before the Sixth International Congress of Genetics.

In their endeavors to get new, faster-growing and otherwise more desirable kinds of pines, the workers at the Institute have resorted to hybridization. This requires the bagging of the cone-forming flowers after they have been pollinated to keep alien pollens borne by the wind from getting in and mess-

The child inhales the gas mixture for ten or fifteen minutes twice a day either just before a meal or two hours after the last meal. If the child starts to have a paroxysm of coughing at the moment the mask is put over his face, it is best to wait until the spell is over before giving the treatment, Prof. Henderson advised.

The use of carbon dioxide inhalations for whooping cough grew out of the similar treatment found successful for treating certain stages of pneumonia and for other lung diseases in infants. In whooping cough the idea is not only to prevent the development of pneumonia but to lessen the whooping stage.

Pneumonia after whooping cough probably comes from the obstruction of the bronchi or bronchioles by mucus, Prof. Henderson explained. The cough and whoop are due to irritation by clinging particles of mucus. Clearing the lungs by deep breathing should not only prevent pneumonia but also have the immediate advantage of diminishing the paroxysms of coughing.

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ing up the results. Since the pine flowers are borne on high, wind-tossed parts of the trees, it has been necessary to devise especially strong bags for this work. These have been fitted with unbreakable transparent windows, so that the progress of the young cones can be watched.

Another technique which has been developed is the bud-grafting of pine trees, hitherto not considered practicable. It is hoped that this can be used in the propagation of especially desirable varieties of hybrid pines, which would not breed true from seed.

Tree seeds may be chosen from selected individuals in the future, instead of being taken wholesale from all the

individuals in a group. The desirability of doing this is indicated by results of "progeny tests" made on a large number of pines, in selected spots in twelve states and British Columbia. A wide variation was found in the growth vigor of seedling offspring of different trees.

There appears to be a falling off in vigor in seedlings of trees growing at high altitudes. However, Mr. Austin reported two trees growing high in the mountains whose seedlings showed great vigor of growth. Since high-altitude trees must needs be hardy, he suggested that these two parent trees may become the founders of tree "families" notable for both hardiness and vigor.

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PUBLIC HEALTH

Experts To Investigate Leprosy in Hawaii

WHETHER or not the federal government should establish a leper colony in Hawaii similar to the one at Carville, La., will be determined as a result of investigations now being made in Hawaii by three experts of the U. S. Public Health Service. Dr. J. C. Perry, Dr. J. W. Kerr and Dr. G. W. McCoy have been instructed by Surgeon General Hugh S. Cumming to study the situation in Hawaii.

The U. S. Public Health Service, in cooperation with the Territorial Government, has since 1905 been operating a station for scientific study of leprosy at Kalihi, T. H. In the course of these studies, many of which have been on the effectiveness of various derivatives of chaulmoogra oil for treatment of the disease, active cases of leprosy are actually treated. However, the station is not able to treat all lepers who may apply, as is done free of charge for lepers in the United States at the colony at Carville. The famous Hawaiian leper hospital at Molakai is less a treatment center and more a custodial home, the U. S. Public Health Service explained.

There is so much leprosy in Hawaii that life is said to revolve around the disease and its problems. Almost every family is affected. The disease is mixed up with the social and political life of the country, and is a normal part of the life of all Hawaiians. Consequently the three federal health officers have a big task ahead to make a real study of the situation and have their report ready by December first when Congress convenes.

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Something YOU HAVE MISSED

HAVE FAMOUS scientists ever told you about fascinating accomplishments in the particular fields in which they work? Wouldn't you like to sit in your home and, at the hour of your choice, listen to Dr. Millikan discuss the rise of physics, or Dr. Welch tell the story of the conquest of the tubercle bacillus? And if a point were not clear to you, wouldn't it be splendid to have that part of the talk repeated?

All these wishes may be yours—made possible by the cooperation of seven great scientists with Science Service in a pioneering venture. On subjects which fired their imaginations, each scientist made a five minute talk recorded on the new process Durium phonograph records.

Durium Products, Inc., made a price on a set of seven such records low enough to be attractive to purchasers. We had portraits of the scientists reproduced in photogravure process, each on a sheet of beautiful white gravure paper, size 8½" x 9". On the reverse side of each picture we printed a brief biography of the scientist, together with his complete speech as recorded on the record.

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CHEMISTRY-ELECTRICITY

Diamond-Hard Materials Seen as Future Development

MATERIALS harder than diamonds yet cheaper than gems, and metal lighter than aluminum but stronger than steel were suggested as possible electrochemical discoveries of the future no more startling than those of the past by Dr. Colin G. Fink, head of the division of electrochemistry of Columbia University, in a nationwide radio talk arranged by Science Service over the Columbia System.

The cooperation of chemistry and electricity produced stainless steel and the chromium-nickel alloy that covers the Chrysler building, according to Dr. Fink. They defy rust and deterioration for all time to come, he declared.

"We need new products and processes to convert our super-heavy railway equipment into such that will excel that of the modern airplane," Dr. Fink continued. "We want to produce by electrical and chemical means... electric lamps ten times as efficient as the best tungsten lamp today, dyes that never fade and silver that does not tarnish."

Interesting experiments in the growth of the electrochemical industry were described.

"Wilson, an American, mixed ordinary marble with coal and passed a strong electric current through the mixture," Dr. Fink stated. "He obtained a new 'stone' or compound, calcium carbide. Returning from lunch on the day of his discovery, it started to rain, and the rain drops coming in contact with this new product caused a hissing sound,

and a powerful gas—acetylene—was evolved. This day marked the birth of one of the foremost of chemical industries: Calcium carbide, acetylene, hydrocyanic gas, acetone, acetic acid, solvents, etc.

E. G. Acheson passed electricity through coal and converted it into graphite—a most valuable lubricant—better and purer than any natural graphite theretofore produced.

F. G. Cottrell suspended a chain through the center of smoke stacks, applied a high voltage current, and lo and behold, no fume, no dust any longer came out of the stacks," he said, "just as though the factories had shut down completely. But, of course, they had not. Electricity was causing those myriads of smoke and fume particles to go down instead of up. And more than this: the dust was collected and in many cases was found to contain valuable constituents such as silver."

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ARCHAEOLOGY

Cavemen's Idea of Magic Shown by Paintings

MAGIC played a large part in the daily lives of men of the Old Stone Age, states Prof. Herbert Kühn, of the University of Cologne, in the German scientific journal *Forschungen und Fortschritte*. He points to five lines of evidence in the cave drawings of

France and Spain in support of his claim.

First, says Prof. Kühn, is the frequent appearance of arrows in the animal drawings, sometimes shown above the animals' heads, sometimes pointed at their bodies. This device is taken to be a method of conjuring the desired game within the range of the hunter's weapons.

Then there is the uneven distribution of the caves in which Stone Age drawings are found. Certain caves, low and difficult of access, appear to have been shrines of magic for centuries, for their walls are thick with paintings, often laid over each other again and again. Neighboring caves, much easier to get into, were totally ignored. Prof. Kühn's inference is that the pictured caves were regarded as specially favorable for the practice of successful magic.

Prof Kühn's third evidence is the appearance of men wearing animal masks and tails in the drawings. These masked figures are usually shown in dancing attitudes, and dances have been a part of primitive religious and magic rites in all historic ages and lands.

In some of the caves there have been found traces of dancing circles, as well as objects, among them sex symbols, which are similar to ceremonial objects used among primitive peoples today in the "initiation" ceremonies by which boys and girls are inducted into full membership in the tribe.

Finally, Prof. Kühn points out the marking, and even the destruction, of the animal figures. Some of them have holes made in them by weapons and even by fingers, some have been thrown into the waters in the caves as if to drown them, and in some of the drawings animals are shown being guided by a sort of fence to a cliff edge over which they will plunge to death. In one North African drawing of the later stone age, a hunter with bow and arrow is shown pursuing his quarry, while a woman—possibly a witch—is shown waving her hands as though in incantation, while a line is drawn connecting her body with his. All these phenomena are considered as various kinds of "sympathetic magic."

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In earlier days on the earth, there were dragon flies that had a wing spread of two feet.

Napoleon Bonaparte took an interest in natural history, and his library contained more than 500 water colors of animals, birds, and plants.

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**Lovers of Open Fields**

FLOWERS of late summer and autumn are predominantly those of the open field and roadside, in contrast to the woodland blossoms we all think of first in connection with spring.

You can make the test yourself. Go out and ask the first friend you meet to name a flower that is in bloom right now. The chances are he will say goldenrod, or wild aster, or sunflower, or perhaps he may remember that despised "donkey's lettuce," the thistle. Flowers of the open, every one. The odds are a hundred to one he won't think of a summer or autumnal woodland flower—he may not even know the name of one. Yet if you had put him to the same test in spring he would surely have answered violet, or trillium, or hepatica, or bloodroot, or spring beauty, and would not have remembered any of the spring flowers that grow in the open.

There is a reason for this, of course. There is an actual scarcity of summer-flowering plants in the woods. In early spring, before the leaves are thick on the trees, plenty of sunlight filters down through their branches to encourage the rich flower population that stars the ground between their trunks. But after the forest canopy has closed itself, only plants that can tolerate deep shade (and they are not many) will consent to bloom. Hence we must turn to the lusty brotherhood in gold and blue that rejoice in the midsummer or early autumnal sun that floods the prairies.

This color contrast between the earlier and later flowers is another noteworthy thing. The colors of early spring flowers are predominantly white and the more delicate tints: white hepatica, white bloodroot, white Dutchman's breeches, light-blue or amethystine

anemone, blue phlox, pink geranium. There are exceptions, of course—the bold red of the columbine or the indigo of the spiderwort, for example—but on the whole the spring fashions of flowerdom demand pastel effects.

Contrast this with the strong yellows and blues that paint the late-summer landscape: goldenrod and wild aster, sneezeweed and thistle, sunflower and ironweed, cassia and verbena, rosinweed and wild bergamot.

Science News Letter, September 3, 1932

PLANT PATHOLOGY**Sick Vegetables Described In New Publication**

THE U. S. Department of Agriculture has issued two new booklets with colored pictures of sick vegetables. These are intended for the guidance of market inspectors, dealers and all persons concerned with the handling of potatoes, tomatoes, peppers and eggplants. They show and describe the typical symptoms of the fungous and bacterial spoilages that attack these vegetables, as well as insect and other animal injuries and some of the "physiological" diseases.

The authors are Dr. George K. K. Link, professor of plant pathology at the University of Chicago, and Dr. Glen B. Ramsey, senior pathologist of the Office of Horticultural Crops and Diseases, with headquarters at the University.

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GEOLGY**Swelling Marble Makes Trouble in Quarries**

MARBLE that swells when the first cuts or drill holes are made in it has been causing trouble in several quarries at Pittsford and South Wallingford, Vt. The spontaneous expansion of the rock is sufficient to bind drills while they are making holes, and suddenly developing fissures have thrown machines weighing a ton off their tracks.

The phenomenon has been studied by George W. Bain of Amherst, Mass. In a report to the *Journal of Geology*, he states his opinion that the marble was placed under pressure many thousands of years ago during a period of mountain formation, and that the recent cuttings by the quarrymen have given it the first chance to expand in ages.

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• First Glances at New Books

Psychology-Anthropology

THE EVOLUTION OF HUMAN BEHAVIOR—Carl J. Warden—*Macmillan*, 248 p., \$3. A psychologist—one who has studied both higher and lower forms of life—has entered the field of the anthropologists, to trace the history of the human race from its beginnings. The psychological approach on this problem is a valuable one, and Dr. Warden handles it capably. He carries the story through from the "fish to man" stage on to present trends in evolution, with the evolution of intelligence always the central theme.

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Sociology

THE CAUSES OF WAR—Various authors—*Macmillan*, 235 p., \$1.50. The World Conference for International Peace Through Religion has brought together a notable discussion of the why of war. Sir J. Arthur Thomson, British biologist and author, writes on "Science and War." Economic, industrial, racial, religious and political aspects receive attention from leaders in these fields.

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General Science

GENERAL SCIENCE FOR TODAY—Watkins and Bedell—*Macmillan*, 653 p., \$1.68. Though prepared for classroom use, adults will enjoy reading this text to renew their acquaintance with the workings of science in the everyday world. Facts are presented as a continuous story and include many of the latest developments.

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Parasitology

KEY-CATALOGUE OF PARASITES REPORTED FOR INSECTIVORA (MOLES, SHREWS, ETC.) WITH THEIR POSSIBLE PUBLIC HEALTH IMPORTANCE—C. W. Stiles and S. F. Stanley—*Govt. Print. Off.*, iv+119 p., 15c. Full description of each host is given, followed by descriptions of all parasites reported.

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Biological Nomenclature

DICTIONARY OF GREEK AND LATIN COMBINING FORMS USED IN ZOOLOGICAL NAMES: Second Edition—E. C. Jaeger—*Thomas*, 157 p., \$1. Every biology teacher should require his students to buy this little book and carry it in the pocket, to be pulled out and used on the spot whenever a new name

comes up. Such a practice would do much to diminish the sad tribe of those who later say they "took biology once, but couldn't get much out of it because there were so many big words."

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Museology

HANDBOOK OF AMERICAN MUSEUMS—American Association of Museums—*Pub. by the Association*, 779 p., \$5. This reference work is the product of years of work, and is much more than a list of the 1,400 museums in the United States. It outlines the history, scope, work and finances of each institution, besides listing the executive officer, library and such other information. The museums of Canada and Newfoundland and the United States possessions are appended. The book was compiled by Lewis Barrington and aides, and edited by L. C. Everard.

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Library Science

PERIODICALS FOR THE SMALL LIBRARY—Frank K. Walter—*American Library Association*, 114 p., \$1. The sixth edition of a book useful to all librarians. In addition to a well-annotated list, there is an introductory chapter on the handling, binding, etc. of periodicals in the library.

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Physics

FIRST PRINCIPLES OF PHYSICS—Robert W. Fuller, Raymond B. Brownlee, and D. Lee Baker—*Allyn and Bacon*, 799 p., \$1.80. LABORATORY EXERCISES to accompany, 293 p., \$1. A high school text that should capture the imagination of students. Its authors are on the faculty of Stuyvesant High School, New York City. The text and exercise book are amply and well illustrated.

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Radio

THE FEDERAL RADIO COMMISSION—Laurence F. Schmeckebier—*Brookings Institution*, 162 p., \$1.50. This service monograph of the United States government describes the history, activity and organization of the Radio Commission.

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Architecture

BRIDGE ARCHITECTURE—Wilbur J. Watson—*J. H. Jansen, Cleveland*, 288 p., \$15. A handsome folio volume containing 200 halftone reproductions of all kinds of bridges, old and new, in many countries. The author believes that in addition to being useful, bridges should be beautiful. He simply and briefly reviews the history of bridge building and describes the development of new types. Photographers, engineers and architects should be delighted with this volume.

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Aviation

WINGS FOR MEN—Frank Wead—*Century*, 333 p., \$4. A narrative of the rise of aviation, through its beginnings with hot air balloons and striving after bird secrets to the modern era of the airplane.

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Engineering-Language

THE ENGINEER'S TECHNICAL DICTIONARY, ENGLISH-FRENCH—Mark Lvoff—*E. & F. N. Spon, London*, 286 p., 6s 4d. Though this is not a very complete dictionary, it will be useful to those possessing some knowledge of French who attempt to read technical articles in this language. Its simplicity is an aid to the quick finding of words.

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Mathematics

PRACTICAL MATHEMATICS—Glenn M. Hobbs, Margaret MacLennan, James McKinney—*American Technical Society*, 448 p., \$2. The work of those who would forge ahead through home study should be simplified by this text. It presents elementary mathematics as far advanced as measurement and logarithms.

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Ornithology

BIRDS OF POLK COUNTY, IOWA—Philip A. DuMont—*Des Moines Audubon Society*, 72 p. An annotated popular checklist, that gives a good cross-section of the avifauna of central Iowa. It is to be hoped that there will be a great increase in local work of this type, for such lists are of use not only in the areas for which they are designed but for purposes of comparison elsewhere.

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